

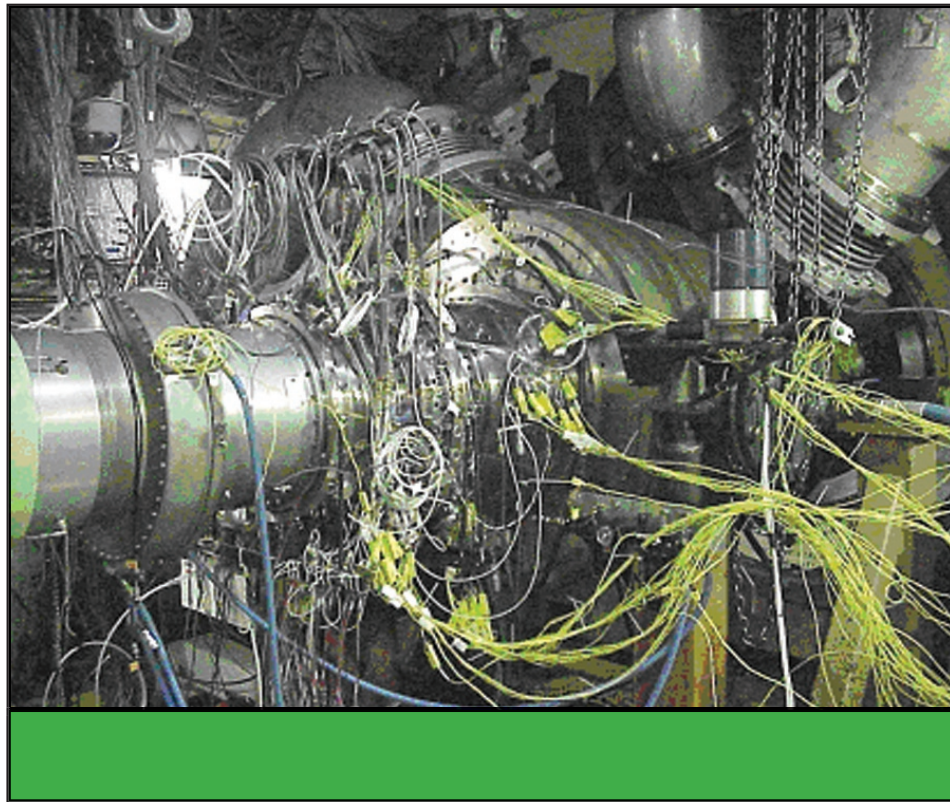


# Air Force Research Laboratory | AFRL

*Science and Technology for Tomorrow's Aerospace Forces*

## **Success Story**

### **SPLITTERED FAN PRODUCES HIGHEST PRESSURE RATIO IN A SINGLE STAGE**



The Propulsion Directorate successfully tested an advanced splitter fan in the directorate's Compressor Research Facility. This fan demonstrated a higher pressure ratio in a single stage than any other single-stage fan built to date. This performance will enable reduced costs, weight, and number of parts for operational weapon systems.



Air Force Research Laboratory  
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Propulsion  
Emerging Technologies

## Accomplishment

Honeywell Engine Systems & Services designed the fan for their Integrated High Performance Turbine Engine Technology (IHPTET) XTL57 Joint Expendable Turbine Engine Concept (JETEC) demonstrator. This new design employs 1/2-cord splitter blades alternating between full cord blades. The fan demonstrated its design pressure and flow rate at 100%, while achieving peak efficiency at 70 to 80% of the design speed. For this test, the inlet flow was distorted at two levels to simulate maneuvering. The fan maintained its high performance during these distortion tests, which, in turn, predicts a good tolerance for high angle of attack maneuvers.

## Background

The IHPTET program is an ongoing national effort to double US military aircraft propulsion capability. The IHPTET team coordinates the gas turbine engine research and development activities of the Army, Navy, Air Force, National Aeronautics and Space Administration, Defense Advanced Research Projects Agency, and six US turbine engine manufacturers.

Honeywell Engine Systems specifically designed this fan for their IHPTET XTL57 JETEC demonstrator. Researchers developed the JETEC technologies in this demonstrator for a limited life turbine engine. For this program, a cost-sharing arrangement between government and industry utilized Dual-Use Science and Technology program funds.

Expendable/limited life engines are one of three classes of engines under the IHPTET technology development program. Typical applications for such engines are cruise missiles and unmanned air vehicles. Compared to current turbine engines, vehicles equipped with a splintered fan engine will demonstrate increased performance, increased range, lower weight, and reduced cost.

## Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (02-PR-02)